

Zebra/Quagga Mussel Surface Survey Protocol

Quagga and zebra mussels are **freshwater** mussels that can physically **attach onto hard substrates**. Small newly settled mussels feel like gritty sandpaper when attached to a smooth surface. Larger mussels will feel coarser (like a small pebble or sunflower seed) or be visually apparent.

Visual and tactile search for zebra and quagga mussels:

Gently run fingers over smooth surfaces, checking for gritty feeling or small “seed-like” or “pebble-like” objects.

- Dock floatation, buoys, mooring line, cables, rocks, concrete, logs/drift wood, vegetation, and anything that has been in the water for a long time.

Pull up and inspect any substrate that is under water.

- trap lines, any line or cable hanging in water

Visually inspect all hard and soft substrates. Fan areas covered with silt to expose mussels. Inspect dark areas (dark substrates and low light/shaded areas).

You are searching adequately if you are finding snails.

Do not touch private vessels.

Prime Areas to Search:

Quagga and zebra mussels prefer dark substrates and low light/dark areas. They prefer concrete over other substrates. Search areas at or near boat ramps, gas dock, dock near marina store, other docks in high traffic areas, all concrete structures, and low flow areas.

Minimum Sample Size:

Search a minimum linear feet of each of the following substrates. You can stop before meeting minimum linear feet if quagga/zebra mussels found in 3 or more locations within the survey location or all available substrate has been searched.

- boat ramp bottom – 100ft if the ramp is at a marina, 200ft if the ramp is the only structure at the survey location
- shoreline - 100ft if at a marina, 200ft if at a survey location with only a boat ramp
- dock - 200ft
- mooring/dock lines (portion hanging in water) - 200ft
- anchor/dock cable or chain (portion under water) - 100ft
- concrete structures - 100ft
- logs and woody debris – 100ft
- All accessible buoys

Make notation in “Comments” section if minimum sample size requirements could not be met.

If Mussels are Found:

Record the lat/long of the mussels' location and mark/describe location on back of datasheet. Record lat/long in decimal degrees and use WSG 84. Record the type of substrate(s) the mussel(s) was found on (for example, concrete, plastic, rope, chain, buoy, etc).

Record up to 3 locations within the survey site. If more locations are found, make a note in the "Comments" section.

At each of the 3 mussel locations, take density estimates using one or both methods:

- Petri dish: place Petri dish over surface. Count all mussels within circle.
- Ruler: place ruler adjacent to mussels. Count all mussels within one inch of ruler. If you cannot see the mussels, count the mussels using touch. If entire ruler cannot be placed on surface, record length of ruler used.
- Collect 5 density estimates per mussel location.

Collect specimens (4-5). Place in Ziploc bag with label. Label should include location, lat/long, date, and name of collector. Seal and keep dry or put in freezer. Do not put water in the bag.

If other species of clams or mussels are found, collect specimens (1-2) and place in bag with collection label. Seal and keep dry or put in freezer. Do not put water in the bag.

Data Reporting:

At the end of each survey day, report survey locations (name and GPS coordinates) and results to Pat Akers at (916) 651-0012. Fax/Mail datasheets to Brianne Noble at (916) 651-0209 (fax) or CDWR Division of Environmental Services, PO Box 942836, Sacramento, CA 95814-6424.

Immediately report potential quagga and zebra mussel sightings to Pat Akers (CDFA) at (916) 651-0012 or to Robert Leavitt (CDFA) at (916) 651-0574.

Send mussel specimens to CDFA Plant Pest Diagnostic Center, 3294 Meadowview Road, Sacramento, CA 95832-1437, attn: Rosser Garrison. Rosser Garrison can be reached at (916) 262-1167.

If in the Colorado River basin, provide samples to Joe Millosovich, DFG, Blythe, CA. Joe can be reached at (760) 922-4928 (office) or (760) 505-7045 (cell).

Equipment/Supplies:

To obtain more surveying equipment, datasheets, or other supplies, contact Brianne Noble (DWR) at (916) 651-0192 (office), (916) 996-0970 (cell), or bnoble@water.ca.gov.